

CHAPTER 1

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CHAPTER 1 INTRODUCTION

1.1 THE COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY

The County Sanitation Districts of Los Angeles County are a confederation of special districts which serve the water pollution control and solid waste management needs of approximately 5 million people in Los Angeles County. The Districts' service area covers approximately 765 square miles and encompasses 78 cities and unincorporated territory within the County. The Districts were formed under authority provided by the County Sanitation District Act of 1923 (the Act) which authorized the formation of sanitation districts based on the topographic boundaries which determine efficient wastewater management, rather than political boundaries. As authorized by the Act, the Districts' role is to construct, operate, and maintain facilities to collect, treat, and dispose of wastewater and industrial wastes. Following a 1949 amendment to the Act, the Districts were empowered to provide solid waste management and disposal services including refuse transfer and resource recovery. Local sewers and laterals which connect to the Districts trunk sewers and solid waste collection are the responsibilities of local jurisdictions within the Districts' service area. The Districts' service area and facilities are shown in Figure ES-1.

The Districts are composed of 26 separate districts which work cooperatively with one another under a Joint Administration Agreement (JAA) with one administrative staff headquartered near Whittier. Each District has a separate Board of Directors which consists of the presiding officers of the governing bodies of each local jurisdiction located within the District. Each District pays its proportionate share of joint administration costs.

The Districts own, operate and maintain over 1,200 miles of main trunk sewers and 11 wastewater treatment plants which convey and treat approximately 500 million gallons per day (mgd) of wastewater. Approximately 35 percent of influent wastewater is treated to a level which is suitable for reuse. The Districts also operate four active sanitary landfills which accept approximately 22,000 tons per day (tpd) of solid waste (approximately half of the waste produced in the County). The Districts also operate a refuse-to-energy facility, three landfill gas-to-energy facilities, two recycle centers, and a refuse transfer station.

1.2 THE JOINT OUTFALL SYSTEM

In conformance with the Districts' regional approach to wastewater management, fifteen of the Districts which are located in the Los Angeles Basin participate in the Joint Outfall Agreement (JOA) which provides for pooled investment in wastewater conveyance, treatment, and disposal facilities. These 15 Districts (Districts Nos. 1, 2, 3, 5, 8, 15, 16, 17, 18, 19, 21, 22, 23, 29, and South Bay Cities) are collectively known as the Joint Outfall Districts (JOD) and are located in the central Los Angeles Basin in the eastern and southern portions of Los Angeles County. The JOD extend south and west from the foothills of the San Gabriel Mountains to the Palos Verdes Peninsula and are bounded on the east by Orange and San Bernardino Counties, on the west by the Cities of Glendale and Los Angeles and the Santa Monica Bay, and on the south by the San Pedro Bay. On July 1, 1995, the number of districts in the JOS will increase to 17 when Districts Nos. 28 and 34, which are located in the City of La Cañada Flintridge in the northern portion of the Los Angeles Basin, become members of the JOS. District No. 2 is the appointed agent of all signatory Districts with respect to matters necessary to carry out the purposes of the JOA.

The JOD have constructed a regional, interconnected system of wastewater conveyance and treatment facilities known as the Joint Outfall System (JOS). The JOS provides wastewater treatment and disposal services for residential, commercial, and industrial users and presently includes six wastewater treatment plants; the Joint Water Pollution Control Plant (JWPCP) located in the City of Carson, the San Jose Creek Water Reclamation Plant (SJCWRP) located adjacent to the City of Industry, the Whittier Narrows Water Reclamation Plant (WNWRP) located near the City of South El Monte, the Long Beach Water Reclamation Plant (LBWRP) located in the City of Long Beach, the Los Coyotes Water Reclamation Plant (LCWRP) located in the City of Cerritos, and the Pomona Water Reclamation Plant (PWRP) located in the City of Pomona with a combined capacity of approximately 576 mgd, more than 1,000 miles of main trunk sewers, and 48 pumping plants. When the La Cañada WRP Outfall Trunk Sewer is completed, the 0.2 mgd La Cañada Water Reclamation Plant, which is located in the City of La Cañada Flintridge, will be connected to the JOS. The JOS service area includes 72 cities (73 cities effective July 1, 1995) and unincorporated territory in the Los Angeles Basin (see Appendix A-1.2). The JOS treatment facilities which serve each jurisdiction within the JOS are listed in Appendix A-1.2. The JOS currently serves approximately 4.6 million people and treats approximately 470 mgd of wastewater. JOS wastewater treatment plants, as shown in Figure 1.2-1, are listed in Table 1.2-1 below:

Table 1.2-1
JOS WASTEWATER TREATMENT PLANTS

Facility	NPDES* Permitted Capacity (mgd)	Level of Treatment
JWPCP	385	Advanced Primary (385 mgd) Secondary (200 mgd)
SJCWRP	100	Tertiary
WNWRP	15	Tertiary
LCWRP	37.5	Tertiary
LBWRP	25	Tertiary
PWRP	13	Tertiary

* NPDES = National Pollutant Discharge Elimination System

The Los Angeles Basin is a large alluvial plain which slopes gently from the foothills of the San Gabriel Mountains in the north to the Pacific Ocean in the south. The JOS was designed to take advantage of this regional topography. Wastewater is collected by local sewers which convey it to JOS trunk sewers which generally flow from east to west and north to south. JOS trunk sewers convey wastewater to one of the six JOS treatment facilities. Each treatment plant serves an area which is primarily located to the east and/or north, or upstream, of the plant. The JWPCP is located at the terminus of the JOS conveyance system. Wastewater flow generated anywhere within the JOS may, therefore, be conveyed to the JWPCP for treatment.

1.2.1 JOS WASTEWATER TREATMENT SYSTEM

The JOS has conceptually evolved into two treatment subsystems; a downstream or coastal subsystem and an upstream or inland subsystem.

The coastal (downstream) subsystem consists of the JWPCP which is located at the terminus of the Districts' JOS trunk sewer network. The JWPCP, which presently has a permitted capacity of 385 mgd, is the Districts' largest wastewater treatment facility. This facility presently provides partial secondary treatment to influent wastewater. All wastewater receives advanced primary treatment, and up to 200 mgd of wastewater receives secondary treatment. All JWPCP effluent is discharged to the Pacific Ocean through the Districts' ocean outfalls two miles off of White's Point (Palos Verdes Peninsula) at a depth of approximately 200 feet. The JWPCP also provides centralized solids processing for all JOS wastewater treatment facilities. Dewatered, digested solids (biosolids) are hauled off site for reuse and/or disposal. The JWPCP currently treats approximately 330 mgd of wastewater and produces approximately 1,300 wet tons per day (wtpd) of biosolids.

The inland treatment subsystem includes five water reclamation plants (WRPs) located upstream of the JWPCP and adjacent to either the San Gabriel River, the Rio Hondo, or San Jose Creek. Each of the WRPs provides tertiary treatment to wastewater selectively routed from predominately residential areas to the WRP. These wastewaters are generally low in mineral content, and the

resulting effluent is, therefore, suitable for reuse. Reclaimed water from the WRPs is presently reused for groundwater recharge, industrial applications, and agricultural and/or landscape irrigation. All WRP effluent which is not reused is discharged to adjacent rivers or creeks in which it eventually flows to the Pacific Ocean. All solids generated at the WRPs are returned to the JOS trunk sewer system for conveyance to the JWPCP for processing. The combined capacity of the WRPs is presently approximately 191 mgd and these facilities currently treat approximately 150 mgd of wastewater. Between July 1993 and June 1994, approximately 74 mgd of reclaimed water produced in the JOS was reused.

The upstream location of the JOS WRPs serves several important functions. First, it allows the Districts to partially segregate easily reclaimable residential wastewater from higher strength, difficult to reclaim industrial wastewater by selectively routing wastewater collected in residential areas to WRPs while routing wastewater collected from industrial areas around the WRPs directly to the JWPCP. Second, the upstream location of the WRPs provides hydraulic relief for trunk sewers upstream of the JWPCP and downstream of the WRPs which saves the capital costs associated with sewer relief projects. The downstream location of the JWPCP allows the Districts to centralize solids processing at this facility and, therefore, to achieve economies of scale in solids processing.

1.2.2 JOS WASTEWATER CONVEYANCE SYSTEM

The Districts own, operate and maintain an interconnected network of trunk sewers which convey wastewater to JOS wastewater treatment facilities. The Districts' trunk sewer system conceptually forms the backbone of the regional sewer system. Lateral sewers which collect wastewater from individual properties drain to local sewers which then drain to Districts' trunk sewers for conveyance to a JOS wastewater treatment facility. Local sewers and laterals are owned, operated and maintained by the local jurisdictions in which they are located.

The Joint Outfall (JO) trunk sewers form the core of the Districts' sewer network and are owned, operated and maintained by the JOD. These sewers are typically large diameter trunk sewers which collect wastewater and convey it toward Districts' treatment facilities. The JO trunk sewers extend from the JWPCP throughout the JOS service area. The basic function of most JO trunk sewers is to collect wastewater from other Districts' trunk sewers, which are owned by individual districts, and/or local sewers and convey it downstream toward a JOS treatment facility. There are also several major interceptor sewers which typically divert predominately residential wastewater with relatively low dissolved solids to a WRP for reclamation or route wastewater with high dissolved solids concentrations around WRPs to the JWPCP.

1.3 JOS PLANNING HISTORY

JOS facilities planning has evolved in response to the needs of the JOS service area. During the early years (1924-1945), as the Los Angeles Basin experienced rapid development, the Districts emphasized the economic and administrative advantages of a regional collection and disposal system. Following passage of the County Sanitation District Act in 1923, joint ownership of facilities under the JOA and joint staffing under the JAA were achieved in 1924 and 1925, respectively. As the population of Los Angeles County doubled from 1.6 million to 3.2 million between 1924 and 1945, economies of scale were achieved in capital investment and in unified technical staffing and administration. In addition, the Districts' regional approach to wastewater management fostered cooperation between neighboring communities which led to mutually agreeable solutions to waste management problems and avoided legal disputes over discharge rights.

The early development of the JOS was characterized by a tributary network of trunk sewers and interceptors which was gradually expanded to the north and east to accommodate growth in the Los Angeles Basin. The JWPCP provided primary treatment to all influent wastewater and all effluent was discharged to the ocean. As growth continued in northern and eastern portions of the County, the regional consolidation of sewerage facilities continued as local wastewater treatment plants in several cities were retired and sewers were constructed to convey flow to the JWPCP.

Very early during the development of the Los Angeles Basin and the JOS, it became apparent that continued growth in this region would be limited by the availability of resources, especially water. In response, the Metropolitan Water District of Southern California (MWD) was formed in 1928 to design and construct facilities to import water to Southern California from the Colorado River. In 1941, the Colorado River Aqueduct was completed and deliveries of imported water to Southern California began soon thereafter. This marked the beginning of Southern California's heavy dependence on imported water supplies. Between 1945 and 1965 the population of Los Angeles County doubled and demands for water correspondingly increased. Despite the import of water from the Colorado River, demands for water by the population of the Los Angeles Basin had outgrown the sustainable yields of local aquifers by 1954. By 1960, local aquifers within the Los Angeles Basin were being significantly overdrawn and groundwater levels in several wells had declined significantly.

In response to the pressing need to develop new water supplies, the Districts' JOS facilities planning began to focus not only on the concept of accommodating growth in the Los Angeles Basin, but also on the ability to augment the regional water supply through water reclamation. In the early 1960's, wastewater flows in the JOS began to approach the capacity limits of downstream trunk sewers and interceptors. At this time, a plan was developed to build WRPs at inland sites as an alternative to the massive expansion of the downstream sewer system and the JWPCP which would have otherwise been necessary. Studies found that it was economically feasible to withdraw wastewater with relatively low dissolved solids concentrations from the largely residential northern and eastern

portions of the JOS and treat it to a level such that it would be suitable for reuse. The proposed inland WRPs were, thus, intended to serve two purposes: hydraulic relief for downstream sewers and the JWPCP and relief for the over drafted aquifers of the Los Angeles Basin.

The basic considerations for water reclamation in the JOS were first identified in a 1949 report prepared by the Districts. A subsequent report in 1958 reaffirmed the findings of the 1949 report and called for the construction of the WNWRP to demonstrate the feasibility of full scale water reclamation. The rationale for inland water reclamation on a systemwide level in the JOS was formally presented in Districts' plans prepared during the early 1960's, first in the 1963 *A Plan for Water Reuse*, and later in the 1965 *Plan A*.

In 1963, *A Plan for Water Reuse* was prepared at the request of the Districts' Board of Directors. This report concluded that inland water reclamation would:

1. Augment the Los Angeles Basin's water resources;
2. Avoid the capital-intensive alternative of providing 50 years' hydraulic relief capacity in large diameter downstream sewers; and
3. Achieve "pay-as-you-go" financing of sewerage facilities through modular plant expansions scheduled at time intervals based on observed population growth rates.

This report called for numerous relatively small WRPs located near potential reclaimed water users throughout the JOS. The report was intended to provide a basis for immediate action and for future facility planning.

In October 1965, the Districts' Boards of Directors adopted *Plan A*, a master facilities plan to provide wastewater collection and treatment facilities in the JOS through the year 2005. *Plan A* concluded that a group of several relatively large inland WRPs operating in concert with the JWPCP would economically and efficiently provide wastewater treatment services while simultaneously effecting future water quality preservation and enhancement. *Plan A* is the foundation of the modern JOS.

1.3.1 THE 1977 JOS FACILITIES PLAN

During the early 1970's legislative actions of the state and federal governments, combined with a decrease in the rate of population growth in Los Angeles County, and the planned implementation of the State Water Project changed the basic assumptions under which *Plan A* was developed. Actions by the Los Angeles Regional Water Quality Control Board under the Porter-Cologne Water Quality Act of 1970 required changes in solids removal and biosolids management at the JWPCP in order to meet tightened effluent standards. The State Ocean Plan of July 1972 and the 1972

amendments to the Federal Water Pollution Control Act, also known as the Clean Water Act (CWA), required several major changes in the JOS including the provision of full secondary treatment at the JWPCP; the implementation of an industrial source control program to control discharges of heavy metals, synthetic organic pollutants, and other incompatible pollutants to the sewer system; and a review of the financing and operation of JOS facilities. In 1974, the RWQCB imposed a requirement that discharges to flood control channels in the Los Angeles Basin must meet Department of Health Services (DHS) standards for water reuse involving unrestricted, direct human contact. In response, tertiary treatment facilities were constructed at JOS WRPs. In addition, the implementation of the State Water Project effectively improved the mineral quality of the water supply and wastewater and increased the costs and energy requirements associated with conventional water supplies. The totality of these changes warranted a reevaluation of the 1965 JOS *Plan A*. This reevaluation ultimately took the form of the 1977 *JOS Facilities Plan* (1977 Plan).

The 1977 Plan was a master facilities plan which was intended to provide wastewater collection, treatment, and disposal services for the JOD through the year 2000, and to upgrade JOS facilities in order to comply with the recently enacted state and federal water quality legislation. According to State of California regulations for administering the Federal Clean Air Act (CAA) at the time the 1977 Plan was developed, wastewater management agencies located in critical air basins were required to base their facilities plans on the lowest population projection for the service area. The Districts' 1977 Plan was, therefore, based on the California Department of Finance (DOF) Series E-O population projection which identified a zero-growth condition in the JOS during the planning period (1976-2000). The stated goals of the 1977 Plan were:

1. To bring the JOS into compliance with state and federal water quality legislation;
2. To provide wastewater conveyance, treatment, and disposal facilities necessary to serve the population tributary to the JOS through the year 2000; and
3. To maximize the potential for water reuse in the JOS.

Accordingly, the 1977 Plan recommended system upgrades and emphasized inland treatment and reuse of wastewater. Proposed system upgrades included the construction of facilities to provide full secondary treatment at the JWPCP and tertiary treatment at all WRPs. In order to facilitate increased water reuse in the JOS, the 1977 Plan proposed to expand the aggregate capacity of the WRPs from 112.5 to 150 mgd (through expansions at the Long Beach and San Jose Creek WRPs) while downscaling the permitted capacity of the JWPCP from 385 mgd to somewhere between 265 and 300 mgd. The year 2000 planned capacity of individual JOS treatment facilities identified in the 1977 Plan is shown in Table 1.3-1.

Table 1.3-1
YEAR 2000 PLANNED CAPACITY OF JOS TREATMENT FACILITIES
IDENTIFIED IN THE 1977 JOS FACILITIES PLAN

JOS Treatment Facility	Year 2000 Planned Capacity
JWPCP	265-300 mgd
SJCWRP	62.5 mgd
WNWRP	15 mgd
LCWRP	37.5 mgd
LBWRP	25 mgd
PWRP	10 mgd
TOTAL	415-450 mgd

1.4 SUBSEQUENT DEVELOPMENTS IN THE JOS

In the period following the completion of the 1977 Plan, construction of wastewater management facilities did not entirely follow the recommendations outlined in that plan due to changes in several conditions.

First, contrary to the DOF Series E-O population projection on which the 1977 Plan was based, the JOS population grew rapidly during the 1980's. In 1976, the estimated JOS population was 3.65 million. The DOF Series E-O population projection estimated that the year 2000 JOS population would, likewise, be only 3.65 million (zero net growth). By 1994, however, the estimated JOS population was approximately 4.6 million people. As the JOS population has increased to unexpected levels following the approval of the 1977 Plan, so has the volume of wastewater generated within the JOS. The 1977 Plan was based on an expected JOS wastewater flow of 415-450 mgd in the year 2000, but by 1989, JOS facilities treated an average daily wastewater flow of 524 mgd. As a result, the 1977 Plan was built-out several years ago, JOS treatment plants have been expanded beyond levels identified in the 1977 Plan, and the operation of the JWPCP has not been downscaled to the level identified in the 1977 Plan. Due to the effects of water conservation measures implemented in response to the recent drought and the effects of the recent recession in Southern California, the per capita wastewater generation rate and total discharge from industrial users have declined. The total JOS wastewater flow began decreasing in 1989. The current average daily JOS wastewater flow is only approximately 470 mgd as opposed to 524 mgd in 1989, but it is uncertain to what degree this recent trend will manifest itself in a permanent change in wastewater generation in the JOS.

Second, in 1977, following completion of the 1977 Plan, amendments to the CWA were passed by the U.S. Congress. One of these amendments, Section 301(h), specifies that the Administrator of the U.S. Environmental Protection Agency (EPA) may issue a permit which modifies the requirements for full secondary treatment of municipal wastewater for discharges into marine waters. Applicants for this modification are required to meet all environmental protection regulations imposed by state and federal agencies and to prove that the discharge will not adversely impact the marine environment. In California, detailed effluent quality standards and treatment plant performance standards for discharges to the ocean are specified in the State Ocean Plan. It was determined that the discharge from the JWPCP could meet the conditions of the State Ocean Plan by employing advanced primary treatment in conjunction with partial secondary treatment. It was also concluded that the reduction of suspended solids discharge attendant with full secondary treatment could have adverse environmental consequences; there is a reservoir of DDT partially buried in the sediments around the JWPCP outfall and there is increased risk that this DDT may be reexposed if solids emissions are reduced following implementation of full secondary treatment. The Districts, therefore, applied for a modification of full secondary treatment requirements at the JWPCP per Section 301(h) of the amended CWA, and only two 100 mgd modules of the three

planned modules identified in the 1977 Plan to provide up to 300 mgd of full secondary treatment capacity at the JWPCP were completed.

The Districts initially submitted an application for a 301(h) permit for the JWPCP to the EPA in 1979. A series of tentative EPA decisions and revised applications by the Districts followed. The Districts submitted the most recent application for a 301(h) permit for the JWPCP to the EPA on January 20, 1988, and the EPA subsequently issued a final denial of the Districts' 301(h) permit application in December 1990. The Districts appealed the EPA's decision. The appeal is an administrative matter, and does not prevent judicial enforcement of EPA's 301(h) decision. In January 1992, the EPA; the California Regional Water Quality Control Board, Los Angeles Region (RWQCB); the Natural Resource Defense Council (NRDC); and Heal the Bay filed suit against the Districts under Section 309 of the CWA in an effort to compel full secondary treatment at the JWPCP. The Districts have negotiated a settlement to the CWA Section 309 enforcement action through a consent decree under which the Districts have agreed to drop their appeal. The consent decree contains a schedule for the construction of facilities to provide full secondary treatment. Substantial penalties will be assessed against the Districts for failing to meet designated deadlines associated with project milestones identified in the consent decree. The consent decree requires that the Districts:

- Complete JOS and JWPCP planning and environmental review by July 31, 1995;
- Complete final design of JWPCP reactors and clarifiers by December 31, 1997;
- Begin construction of JWPCP reactors and clarifiers by April 30, 1998;
- Complete construction and begin startup of JWPCP full secondary treatment facilities by June 30, 2002; and
- Achieve full compliance with the Section 301(b) of the Clean Water Act, which mandates full secondary treatment of municipal wastewaters, by December 31, 2002.

1.5 NEED FOR PROJECT

The 1977 JOS Facilities Plan identified the facilities necessary to comply with all of the then existing state and federal water quality legislation and to provide wastewater collection, treatment, and disposal services for the projected JOS population through the year 2000 (per the DOF Series E-O population projection). Several of the key assumptions around which this plan was developed, although based on sound judgement at the time, were incorrect, and the Districts have recognized the need to update the 1977 Plan. The Regional Comprehensive Plan (RCP) prepared by the Southern California Association of Governments (SCAG), which contains population projections on which this facility plan is based, projects continued significant population growth through the year 2010. JOS wastewater flows are expected to increase significantly in response to population growth. The Districts must expand wastewater conveyance and treatment facilities in order to accommodate expected growth. In addition, the Districts have entered into a consent decree which outlines a schedule for providing full secondary treatment to all JOS wastewater flows by December 31, 2002. The JOS facilities planning process must coincide with planning for the JWPCP full secondary treatment project since the JOS facilities plan will identify the optimal split of wastewater flow between upstream (WRPs) and downstream (JWPCP) treatment facilities.

The projected increases in demand for wastewater services require that the Districts prepare an updated JOS Master Facilities Plan. This updated plan, the 2010 JOS Master Facilities Plan (2010 Plan), will build on earlier planning efforts including the 1963 *A Plan for Water Reuse*, the 1965 *Plan A*, and the 1977 *JOS Facilities Plan*. The 2010 Plan will recommend a system configuration to provide wastewater service within the JOS planning area through the year 2010, including the appropriate capacity of secondary treatment facilities at the JWPCP. The planning objectives of the 2010 Plan are twofold:

- Provide full secondary treatment for all flows as required by a Consent Decree between the Districts, the United States, the State of California, the Natural Resources Defense Council, and Heal the Bay, and
- Provide wastewater conveyance, treatment, and reclamation/disposal facilities to meet service area needs through the year 2010 in a cost effective and environmentally sound manner.